

STANDARD OPERATING PROCEDURE

DRINKING WATER COMPLIANCE SAMPLING



Water Quality Division
Drinking Water Value Stream

Scope: Proper sampling procedures to use when taking compliance Drinking Water samples.

Creation Date: 09/12/2018
Last Revision: 09/12/2018
Publication No.: TM-18-30

General

The objective of compliance sampling is that the samples will be representative of all contaminants of the system or source, and that the sample will be handled in so that no significant changes in composition will occur in transit to the certified laboratory.

This SOP covers steps required by ADEQ field samples and recommended to be used by all Public Water Systems when performing sampling to be used for compliance data required by the Drinking Water Rules (40 CFR §141).

Procedures Overview

1. Materials needed
 - a. Sample Bottles
 - i. Travel Blanks
 - ii. Sample Labels
 - b. Personal Protective Equipment
 - c. Chain of Custody
 - d. Cooler/Ice Chest
 - e. Ice
 - f. Optional, but recommended materials
 - i. Temperature Blanks
 - ii. Zipper bags
 - iii. Custody Seals

- iv. Sampling Plan
- 2. Sampling Steps
 - a. Distribution System Samples
 - b. EPDS Samples
- 3. Labeling/Completing the COC
- 4. Transport to the Lab
- 5. Arizona Department of Health Services Certified Drinking Water Laboratories

Procedures

1. Materials Needed

- a. *Sample bottles* should be provided by the Arizona certified laboratory of choice. Acids and Bases are used as preservation in many of the sample bottles associated with drinking water sampling. These preservatives can be dangerous and must be handled with care.
 - i. *Travel Blanks* should be used in Volatile Organic Chemical sampling or other sampling that the laboratory suggests. Travel blanks are usually DI water in the same sample container that the samples will be taken in with custody seals intact that can be provided by the laboratory. These Travel Banks are meant to travel with the samples to ensure that any detect of contaminants is a results of the source being sampled and was not acquired during the transport process.
 - ii. *Sample labels* are important to prevent sample misidentification. Sample labels should at least include sample location, sample preservative, and sample date and time. If labels are not already on the sample bottle when received from the laboratory, make sure to complete the labels and affix them to the bottles. Sample label information should match the information provided on the Chain of Custody.
- b. *Personal Protective Equipment (PPE)* including gloves, eye protection, closed toe shoes, etc. should be used when taking water samples. These PPE both protect the sampler from the preservatives in the sample bottles (or being added to the sample bottles) and

also the sample from outside influence. Pants and long sleeve shirts can also assist in the protection of the skin from the acid preservatives used.

- c. *Chain of Custody* records should be used when taking all water samples. The chain of custody is a legal document that ensures sample integrity from collection to data reporting. The purpose of this document is to track who has possession of and is handling the sample at all times. The Chain of Custody information should match the information provided on the sampling labels on each bottle. This helps the laboratory match the sample bottles to the correct Chain of Custody.
- d. *Cooler/Ice Chest* is needed for transport of the samples once they have been collected.
- e. *Ice* is needed to keep the samples at the recommended temperature of $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Wet ice is recommend over blue ice packs.
- f. *Optional, but recommended materials*
 - i. *Temperature Blanks* are small bottles filled with tap water and are used to take the temperature of the samples in the cooler, so as not to disturb the actual samples.
 - ii. *Zipper Bags* can be used to ensure that samples are not contaminated by other samples or by the ice used in the transport cooler.
 - iii. *Custody Seals* can be used to deter unauthorized tampering of samples. If you chose to use custody seals, attach the seal around the lid of the containers in such a way that it is necessary to break the seal in order to open the container.
 - iv. *Sampling Plans* are required for most, if not all, of the distribution sampling. It is recommended that the sampling plans are present during sampling to make sure that the samples are taken in the correct (approved) locations and the appropriate times.

2. Sampling Steps

- a. *Distribution System Samples* – all distribution system samples should have a sampling plan on file with the Public Water System. Please review this and/or take it with you when sampling to ensure the samples are taken at the correct time and location for compliance purposes.

- i. Put on your PPE.
- ii. Chose the correct sample bottle. Check with your laboratory if you are uncertain.
- iii. Prepare your sampling area. This includes cleaning the area and the sample tap, and removing the aerator for any Total Coliform bacteria sampling in the distribution system.
- iv. Remove the sample bottle top, including any shrink wrap. The bottle top should be kept in your hand or placed facing upwards so that the portion of the cap that touches the bottle does not touch the surface. If you hold the top in your hand, make sure to not let anything touch the inside of the cap or the rim.
- v. It is good practice to disinfect the sample tap prior to sampling. This can be done with Isopropyl Alcohol, hypochlorite, or another bleach solution. IF YOU ARE SAMPLING FOR LEAD AND COPPER SKIP THIS STEP!
- vi. Flush the tap fully open for approximately 5 minutes (make sure you can no longer smell the disinfectant, if used) before returning the stream of water to the width of a pencil to fill the sample bottle. IF YOU ARE SAMPLING FOR LEAD AND COPPER SKIP THIS STEP!
- vii. If the sample bottle is unpreserved you make rinse the bottle with the water a few times before filling the bottle. If the sample bottle contains and type of preservative DO NOT rinse the bottle. Do not touch the inside of the bottle.
- viii. Add any preservative if directed to do so by the laboratory sampling instructions.
- ix. Fill the sample bottle leaving air space of approximately 1% to provide the laboratory room to homogenize the sample prior to analysis. For Total Coliform bacteria sample make sure that there is at least 100mL in the sample bottle. For TTHM samples DO NOT leave any headspace (air bubbles). Follow any direction provided to you by your laboratory.
- x. Place the top back on the sample bottle.
- xi. Write the sample location, sample date and sample time on the sample label and place on the bottle.

b. Entry Point to the Distribution System (EPDS) Samples

- i. Put on your PPE.
- ii. Prepare your sampling area. This includes cleaning the area and the sample tap.
- iii. Chose the correct sample bottle. Check with your laboratory if you are uncertain.
- iv. Remove the sample bottle top, including any shrink wrap. The bottle top should be kept in your hand or placed facing upwards so that the portion of the cap that touches the bottle does not touch the surface. You may also hold the top in your hand, making sure to not let anything touch the inside of the cap or the rim.
- v. Flush the tap for a length of time based on the pipe diameter, distance to the main and flow rate to acquire a representative sample, or for 5 minutes before returning the stream of water to a flow slow enough to fill the sample bottle without creating any splash back.
- vi. If the sample bottle is unpreserved you make rinse the bottle with the water a few times before filling the bottle. If the sample bottle contains and type of preservative DO NOT rinse the bottle. Do not touch the inside of the bottle.
- vii. Add any preservative if directed to do so by the laboratory sampling instructions.
- viii. Fill the sample bottle leaving air space of approximately 1% to provide the laboratory room to homogenize the sample prior to analysis. For VOC samples DO NOT leave any headspace.
- ix. Place the top back on the sample bottle.
- x. Write the sample location, sample date and sample time on the sample label and place on the bottle.

3. Labeling/Completing the Chain of Custody

- a. Complete the Chain of Custody record for each sample or group of samples. The form should include at least the sample location, sample date, sample time, and analyses requested. The signature of the persons relinquishing the samples and receiving the samples, along with the date and time of sample transfer, should be completed at each hand off of the samples.

- b. If the sample is for compliance that must be indicated on the chain of custody prior to the sample being analyzed by the laboratory. Check your lab's Chain of Custody, if there is not a location specified for you to indicate whether the sample is for compliance or not, write on the form whether it is for compliance or not for compliance (special purpose sample).
- c. This form is a legal document and as such should be completed as accurately as possible.

4. Transport to the Laboratory

- a. Place the sample bottles and completed/signed chain of custody in the cooler/ice chest. If the Chain of Custody will be transported inside the cooler with the samples, place it in a zipper bag to prevent it from getting wet and keep the ink from running while in the cooler.
- b. Nearly all of the drinking water compliance sample methods require samples to be kept at 2° - 10°C. If you are sampling in the summer months, or your certified laboratory is in the Southern half of the state, it is strongly recommended that you use "wet ice" as opposed to the blue ice packs.
- c. If you are shipping samples to your lab, it is strongly recommended that you place a trash bag or large plastic bag in the cooler prior to adding the samples and ice. If the cooler starts leaking in transit, many shipping companies will hold the packages and open them to ensure that there are no hazardous materials leaking out. This could significantly delay your samples and possibly cause them to exceed the holding time.
- d. Ensure that the transport to the lab accounts for all hold times of the analyses that are being requested.

5. Arizona Department of Health Services Certified Drinking Water Laboratories

All compliance drinking water samples must be analyzed at a laboratory that has been certified by Arizona Department of Health Services (AZDHS). Below is a list of these laboratories as of 09/12/2018. This list will be updated every six months. The most current list updated by AZDHS can be found at:

<https://app.azdhs.gov/BFS/LABS/ELBIS/DrinkingWaterTestingLabs/DrinkingWaterSearchContentPage.aspx>

Lab Name	City	State	Phone
Mohave Environmental Labs	Bullhead City	AZ	(928) 754-8101
Radiation Safety Engineering, Inc.	Chandler	AZ	(480) 897-9459
Global Environmental Consulting, LLC	Concho	AZ	(928) 537-7755
Inner Basin Environmental, LLC	Flagstaff	AZ	928-440-5168
Nortest Analytical	Flagstaff	AZ	(928) 774-2312
Statewide Laboratory	Mesa	AZ	(480) 981-8859
Nestle Waters North America	Phoenix	AZ	(602) 547-3834
Nestle Waters North America	Phoenix	AZ	(602) 547-3834
Legend Technical Services of AZ, Inc.	Phoenix	AZ	(602) 324-6103
Aerobiology Laboratory Associates Inc.	Phoenix	AZ	(602) 441-3700
Inter Ag Services	Phoenix	AZ	(602) 273-7248
Motzz Laboratory, Inc.	Phoenix	AZ	(602) 454-2376
TestAmerica Laboratories, Inc.	Phoenix	AZ	(602) 437-3340
Fiberquant Analytical Services	Phoenix	AZ	(602) 276-6139
Bradshaw Mountain Environmental Inc.	Prescott Valley	AZ	(928) 778-4510
Aquatic Consulting & Testing, Inc.	Tempe	AZ	(480) 921-8044
Apex Analytical Laboratory, LLC	Tempe	AZ	(602) 437-0762
XENCO Laboratories	Tempe	AZ	480-355-0900
Turner Laboratories, Inc.	Tucson	AZ	(520) 882-5880
Complete Analytical Services, LLC	Tucson	AZ	(520) 884-5811
Legend Technical Services, Inc.	Tucson	AZ	(520) 327-1234
Fresh Terra Services	Yuma	AZ	928 257-3601
Agri-Trend Lab & Consulting, Inc.	Yuma	AZ	(928) 317-0456
Enthalpy Analytical, LLC	Berkeley	CA	(510) 486-0900
TestAmerica	Irvine	CA	(949) 261-1022
Eurofins Eaton Analytical, LLC	Monrovia	CA	(626) 386-1100
EMAX Laboratories, Inc.	Torrance	CA	(310) 618-8889
Orange Coast Analytical, Inc.	Tustin	CA	(714) 832-0064

When in doubt, contact your laboratory contact to get more detailed instructions on how to perform sampling based on the analyses being requested.

TestAmerica Sacramento	West Sacramento	CA	(916) 373-5600
ALS Environmental - Fort Collins	Fort Collins	CO	970 490-1511
ACZ Laboratories, Inc.	Steamboat Springs	CO	(970) 879-3590
SGS North America Inc. - Orlando	Orlando	FL	407-425-6700
Maxxam Analytics	Kennesaw	GA	(770) 499-7500
SVL Analytical, Inc.	Kellogg	ID	(208) 784-1258
Anatek Labs, Inc	Moscow	ID	208-883-2839
Eurofins Eaton Analytical, LLC	South Bend	IN	(574) 233-4777
SGS North America Inc. - Scott	Scott	LA	337-237-4775
Northeast Laboratory Services	Winslow	ME	(800) 244-8378
National Testing Laboratories, LTD.	Ypsilanti	MI	(734) 483-8333
Pace Analytical Services, LLC.	Minneapolis	MN	(612) 607-1700
SGS North America Inc. - Dayton	Dayton	NJ	(732) 329-0200
Hall Environmental Analysis Laboratory, Inc.	Albuquerque	NM	(505) 345-3975
PACE Analytical Services, LLC - Pittsburgh PA	Greensburg	PA	724 850-5600
Eurofins Lancaster Laboratories Environmental, LLC	Lancaster	PA	(717) 656-2300
Environmental Science Corporation dba PACE Analytical National	Mt. Juliet	TN	(615) 758-5858
TestAmerica Laboratories, Inc	Nashville	TN	(615) 726-0177
Xenco Laboratory	Dallas	TX	(214) 902-0300
ALS Laboratory Group, Environmental	Houston	TX	(281) 530-5656
Xenco Laboratories	Stafford	TX	281-240-4200
EDGE Analytical, Inc	Burlington	WA	360-757-1400
ALS Environmental	Kelso	WA	(360) 577-7222
LAB / COR INC.	Seattle	WA	

When in doubt, contact your laboratory contact to get more detailed instructions on how to perform sampling based on the analyses being requested.